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Reclamation of a bare industrial area contaminated by non-ferrous metals: *In situ* metal immobilization and revegetation

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Abstract

To reduce the environmental impact of a 135-ha bare industrial area with a highly phytotoxic soil contaminated by non-ferrous metals, a rehabilitation strategy was developed, aimed at the restoration of a vegetation cover. Two different techniques to overcome the high phytotoxicity of the soil were first evaluated on a laboratory scale: reduction of soil phytotoxicity by the addition of a powerful metal immobilizing substance and use of metal-tolerant plants. Since a combination of both approaches proved most promising, this strategy was subsequently utilized in a 3-ha field experiment on the most contaminated location of the industrial area. After soil treatment and sowing of seeds of metal-tolerant grasses, a complete and healthy vegetation cover was quickly established, even at the sites where metal concentrations were extremely high. The reduction of soil phytotoxicity by addition of beringite was immediate and was

confirmed 15 months after the treatment. Thirty months after the reclamation activities, the vegetation is still healthy and vegetative and generative plant propagation is abundant.



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Keywords

Metals; reclamation; phytotoxicity; metal immobilization

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